

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Mitigation of Orbital Debris	)	IB Docket No. 02-54
	)	

**REPLY COMMENTS OF TELESAT CANADA**

Telesat Canada (“Telesat” or “the Company”) has reviewed the comments filed with the Federal Communications Commission (“FCC” or “the Commission”) in the above captioned proceeding and is pleased to provide the following reply comments. Specifically, there are two points which Telesat made in its original comments<sup>1</sup> which the Company would like to re-iterate in response to positions taken by other parties filing comments in this proceeding, namely, 1) satellite facility operators have strong incentives to minimize orbital debris, and 2) it would be inappropriate for the Commission to extend space station orbital debris conditions to non-U.S. licensed space stations, either directly or through U.S. earth station licensing procedures.

While Telesat is restricting its reply comment to these two issues, this should not be taken to mean that the Company agrees with, or accepts, any other arguments or positions advanced by others which might be contrary to Telesat's interests.

**1. Satellite facility operators have strong incentives to minimize orbital debris.**

Certain parties question whether satellite facility operators will have adequate incentives to adopt appropriate orbital debris mitigation practices absent explicit regulation. For example, at page 2 of its comments the National Remote Sensing & Space Law Center (“NRSSLC”) alleges that “economic incentives” will not always ensure that satellite operators will comply with orbital

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<sup>1</sup> Comments of Telesat Canada (dated July 17, 2002) filed in response to *Mitigation of Orbital Debris* (Notice of Proposed Rule Making) FCC 02-80, IB Docket No. 02-54 (adopted March 14, 2002) (“NPRM”).

debris mitigation practices.<sup>2</sup> As an example, NRSSLC claims that, in the design phase, an operator may decide to omit “hardening” and/or “shielding” of a satellite structure due to the additional cost of doing so and because of a “weight penalty” that could reduce the amount of on-board revenue-generating payload.<sup>3</sup> Similarly, in his comments Victor Slabinski contends that “practical obstacles”, including retirement, death or overwork of knowledgeable spacecraft engineers, sale of the space assets to another party, equipment failure or idiosyncrasies of particular space stations, may hamper or preclude proper end-of-life disposal of satellites by their operators.<sup>4</sup> To address this matter, Mr. Slabinski suggests that the Commission consider requiring satellite operators to make a “disposal altitude monetary deposit”, in the order of \$1 million per spacecraft, before satellite launch, claiming that this will provide operators with the necessary economic incentives to ensure proper end-of-life disposal of a satellite.

In their respective comments, PanAmSat Corporation (“PanAmSat”) and the Satellite Industry Association (“SIA”) take the completely opposite view. Specifically, PanAmSat states that:

The voluntary efforts of industry, along with guidelines developed under the auspices of the International Telecommunications Union (‘ITU’) and the National Aeronautics and Space Administration (‘NASA’), have been and are sufficient to address debris mitigation issues, without the need for Commission regulations. There have been no problems under the current voluntary procedures and the satellite industry has every incentive to address debris mitigation and the risk of collisions without regulatory mandates.<sup>5</sup>

In support of this position, PanAmSat notes that operators have an economic incentive to maintain a safe environment for operating GSO satellites, due to the simple fact that there are substantial costs – “totaling hundreds of millions of dollars per spacecraft” – associated with the construction, launch and operation of those satellites.<sup>6</sup> PanAmSat further notes that this incentive is “slot-specific”, in that GSO satellite operators have an “expectancy” that they will be permitted to operate a follow-on satellite in this same orbital location. Thus, if these operators do not dispose of their satellites safely at end of life, they will be placing their own replacement satellites – costing “hundreds of millions of dollars per spacecraft” – at risk.

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<sup>2</sup> Comments of NRSSLC at 2, IB Docket No. 02-54 (dated July 16, 2002) (“NRSSLC Comments”).

<sup>3</sup> *Id.* at 2.

<sup>4</sup> Victor Slabinski, Comment on Disposal of Retired GEO Communications Satellites, at 1, IB Docket No. 02-54 (dated July 11, 2002) (“Slabinski Comments”).

<sup>5</sup> Comments of PanAmSat Corporation at 2, IB Docket No. 02-54 (dated July 17, 2002) (“PanAmSat Comments”).

PanAmSat also notes that the Commission's current voluntary post-mission disposal policy is having the desired effect, as evidenced by the fact that there are no documented cases of GSO satellites having caused damage after they were decommissioned. Given that decommissioned GSO satellites have caused no damage and that the satellite industry is actively engaged in the disposal issue, PanAmSat concludes that orbital debris regulation "is a solution in search of a problem."<sup>7</sup>

SIA is also of the view that the Commission can depend on the self-interest of satellite operators to avoid the creation of orbital debris:

As manufacturers and operators of spacecraft, SIA members are vitally interested in minimizing any risks of spacecraft collision. SIA members are driven by economic and operational self-interest to design and operate their spacecraft for longevity and reliability and to relocate spacecraft to safe graveyard orbits.

Inadequate collision or debris mitigation measures raise the collision risks to the satellite operators' existing and future spacecraft and threaten the future commercial viability of the operators. Operators cannot ignore debris mitigation in favor of profit maximization at any stage in a satellite's life. Thus, satellite operators are self-motivated to build and operate spacecraft that will not be damaged or fail in-orbit, in order to preserve their essential (and very costly) operating assets. In addition, satellite operators have a commercial interest in relocating their spacecraft to safe orbits at end-of-life. This keeps their assigned orbit free of debris so they can exercise their 'replacement expectancy' and continue to safely use their assigned orbital locations.<sup>8</sup>

Like PanAmSat, SIA also points out that no U.S.-licensed satellites have suffered collisions or caused orbital debris:

The strength of economic incentive throughout mission life – and the success of self-regulation – is demonstrated by the fact that to date no FCC-licensed commercial satellite has exploded once launched into space and none have suffered a collision in space.<sup>9</sup>

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<sup>6</sup> PanAmSat Comments at 3.

<sup>7</sup> PanAmSat Comments at 4.

<sup>8</sup> Comments of the Satellite Industry Association at 2, IB Docket No. 02-54 (dated July 17, 2002) (citation omitted) ("SIA Comments").

<sup>9</sup> SIA Comments at 3.

Thus, SIA similarly concludes that the Commission “has not identified a problem that requires regulation.”<sup>10</sup>

For the reasons discussed at length in its earlier comments in this proceeding, Telesat agrees that satellite operators have strong economic incentives to minimize orbital debris over every stage of a satellite’s life, and that it is standard practice in the industry for operators to take all necessary precautions to safeguard against accidental explosions and to make sure that satellites are safely disposed of at their end of life. Indeed, with the cost of a satellite running into the hundreds of millions of dollars, it would not make sense, as NRSSLC suggests, for satellite operators to shave their satellite construction costs by a few thousand dollars or augment the amount of on-board revenue-generating payload by electing to omit “hardening” and/or “shielding” of a satellite structure. Any such action would seriously compromise the integrity and survivability of a satellite and leave the operator exposed to a catastrophic loss of the entire revenue-generating payload of that satellite, as well as the prospect of an impaired orbital position for future replacement satellites.

Similarly the “practical obstacles” to the safe decommissioning of satellites which Mr. Slabinski alleges may arise are hypothetical and provided without any supporting evidence. Indeed, many generations of GSO satellite have been launched and decommissioned over the past 30 plus years that such satellites have been in existence, and, as both PanAmSat and SIA note, there are no documented instances of these satellites having caused damage after they were decommissioned.

Mr. Slabinski’s proposal that the Commission consider requiring satellite operators to make a “disposal altitude monetary deposit” before satellite launch is similarly without merit.<sup>11</sup> Given the huge cost of constructing and launching replacement satellites and the risk orbital debris would pose for that investment, operators already have a strong economic incentive to make sure satellites are safely disposed of at their end of life. Imposing a “disposal altitude monetary deposit” on new satellites will not materially affect this incentive. However, it would increase

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<sup>10</sup> SIA Comments at ii.

<sup>11</sup> Slabinski Comments at 1.

the operator's costs and that added cost would translate directly into higher prices for satellite service users.

**2. It would be inappropriate for the Commission to attempt to extend its orbital debris regulation to non-U.S licensed satellite operators.**

On the matter concerning the scope of proposed rules in relation to non-U.S. licensed satellite operators, NRSSLC takes the position that it may be necessary to require satellite operators to submit debris mitigation plans to the Commission, unless the satellite operator can submit evidence that the satellite system's debris mitigation plans are subject to "direct and effective regulatory oversight" by the operator's national licensing authority.<sup>12</sup> Similarly, even though SIA states that there is no need for the Commission to adopt any regulatory requirements to address orbital debris mitigation,<sup>13</sup> it argues that any rules the Commission adopts in this proceeding for U.S. licensed satellite operators should also be applied to non-U.S. licensed operators, or that the Commission should require evidence on a case-by-case basis whether a foreign licensee is subject to similar debris mitigation rules by another licensing authority.<sup>14</sup>

However, as Arianespace observes in its comments, international standard-setting bodies such as the Inter-Agency Space Debris Coordination Committee ("IADC") and the United Nations Committee on Peaceful Uses of Outer Space ("UNCOPUOS") are in existence and have historically been the vehicle for developing international cooperation in outer space activities.<sup>15</sup> Indeed, as Arianespace further notes, within these organizations an international effort to extend the general principles of space treaties into specific orbital debris mitigation guidelines is currently underway, with the issuance of draft orbital debris mitigation standards expected in early 2003.<sup>16</sup>

The U.S. is an active member of these organizations and will undoubtedly have a significant influence on the guidelines ultimately adopted. Virtually all countries with space programs are

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<sup>12</sup> NRSSLC Comments at 4.

<sup>13</sup> SIA Comments at ii and 3.

<sup>14</sup> SIA Comments at 18.

<sup>15</sup> Comments of Arianespace at 4, IB Docket No. 02-54 (dated July 17, 2002) ("Arianespace Comments").

members of or involved with these international organizations, and each of them can be expected to ratify the orbital debris mitigation standards developed and adopted through international consensus by these organizations. The U.S. clearly already has the means and opportunity of ensuring appropriate orbital debris mitigation is practiced by non-U.S. satellite operators, making FCC efforts in this regard redundant, if not disruptive. Moreover, any attempt by the Commission to unilaterally impose orbital debris mitigation requirements on non-U.S. licensed satellite operators, either directly or through earth station licensing procedures, would be seen as an extraterritorial encroachment on the rights and responsibilities of other sovereign nations. Further, such action would invite similar actions by other licensing administrations, to the detriment of more open international satellite service markets in general, and to U.S. operators wishing to offer services internationally in particular.

Telesat therefore agrees with Arianespace that international organizations such as IADC and UNCOPUOS are the appropriate bodies to set international orbital debris mitigation standards and that it would be unnecessary and inappropriate for the Commission to unilaterally extend any orbital debris rules it adopts in this proceeding to non-U.S. licensed operators.

## **Conclusion**

In Telesat's view, the record of this proceeding demonstrates that satellite operators have strong incentives to design and operate their satellites to minimize orbital debris at all stages of operation and to safely dispose of their satellites at end of life, and this should temper the extent and nature of any regulatory rules adopted by the Commission in this proceeding. Moreover, in the event that the Commission should decide to impose some level of orbital debris regulation on U.S. satellite licensees, it would be unnecessary and inappropriate for the Commission to attempt to extend this regulation to non-U.S. licensed operators. International organizations are currently developing consensus orbital debris mitigation guidelines and can be relied upon to see that appropriate international guidelines are implemented and enforced as necessary across the whole international satellite community. The Commission need not, and should not, attempt to

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<sup>16</sup> Arianespace Comments at 5.

unilaterally impose any orbital debris mitigation rules it adopts in this proceeding on satellites licensed by other administrations and operating in non-U.S. administered orbital locations.

Telesat appreciates having the opportunity to provide the Commission with these reply comments and trusts they will be useful in its deliberations on these important matters.

Respectfully submitted,

Telesat Canada

A handwritten signature in black ink, appearing to read 'Paul D. Bush', with a large circular flourish on the left and a horizontal line extending to the right.

Paul D. Bush  
Vice President – Corporate Development

August 16, 2002